

Patent claims

1. Apparatus for filtering data symbols (ES) for a decision based data processing system (7) having:

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(a) a buffer store (13) for buffer-storing a sequence of n sequentially received data symbols (ES) and having

10 (b) an n th-order median filter (24) which calculates the minimum intervals (a_{\min}) between the n buffer-stored data symbols and nominal data symbols (ES_{nominal}) and filters out that data symbol whose calculated minimum interval ($a_{I\min}$) has a mean
15 value for the calculated minimum intervals.

2. Apparatus for filtering data symbols according to Claim 1,
characterized

20 in that the median filter (24) has:

(b1) a plurality of calculation circuits (16-i) which respectively calculate a minimum interval ($a_{I\min}$) between a buffer-stored data symbol (ES) and the
25 predetermined nominal data symbols (ES_{nominal});

(b2) a control circuit

30 which has a sorting circuit for sorting the calculated minimum intervals according to their value and

a selection circuit for selecting a mean minimum interval ($\text{Median}(a_{I\min})$) from the group of sorted
35 minimum intervals; and

(b3) a multiplexer which connects the buffer-stored data symbol associated with the selected mean

minimum interval to the decision based data processing system (7).

3. Apparatus according to Claim 1,
5 characterized
in that the buffer store (13) is a FIFO register.
4. Apparatus according to Claim 1,
characterized
10 in that the median filter (24) is an nth-order median filter, where n is an odd number.
5. Apparatus according to Claim 4,
characterized
15 in that the median filter (24) is a third-order median filter.
6. Apparatus according to Claim 4,
characterized
20 in that the median filter (24) is a fifth-order median filter.
7. Apparatus according to Claim 1,
characterized
25 in that the decision based data processing system (7) is a clock phase detector.
8. Apparatus according to Claim 1,
characterized
30 in that the decision based data processing system (7) is a carrier phase detector.
9. Apparatus according to Claim 1,
characterized
35 in that the decision based data processing system (7) is an equalizer.
10. Apparatus according to Claim 1,

characterized

in that the nominal data symbols (ES_{nominal}) are stored in a register (14) which is programmable.

- 5 11. Method for filtering data symbols for a decision based data processing system having the following steps:
- 10 (a) a sequence of n sequentially received data symbols (ES) is buffer-stored (S1);
- (b) the minimum intervals (a_{min}) between the buffer-stored data symbols (ES) and predetermined nominal data symbols (ES_{nominal}) are calculated (S2);
- 15 (c) the minimum intervals (a_{min}) are sorted according to their value (S3);
- (d) a mean minimum interval (Median) is selected from the group of sorted minimum intervals (S4);
- 20 (e) the buffer-stored data symbol (ES) associated with the selected minimum interval is output to the decision based data processing system (7).